
Parallels

Upgrading to Parallels Virtuozzo Containers 4.6



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About This Document

This document familiarizes you with the way to upgrade the following products to Parallels Virtuozzo Containers 4.6 for Linux:

- Parallels Virtuozzo Containers 4.0
- SWsoft Virtuozzo 3.0 Service Pack 1
- OpenVZ

Note: Upgrading from the Beta version of Parallels Virtuozzo Containers 4.6 is not supported.

Upgrade Scenarios

Before beginning the upgrade process, it is important to choose the proper upgrade scenario. Doing so will help you avoid difficulties you may otherwise encounter and will also ensure you can successfully solve any problems that may still occur. You can use one of the following scenarios to upgrade your system:

First Scenario

Typically, you perform a straightforward upgrade of an existing system. Detailed information on how to upgrade your system using this scenario is provided in the following sections of this document:

- Upgrading from SWsoft Virtuozzo 3.0 Service Pack 1 (p. 7)
- Upgrading from Parallels Virtuozzo Containers 4.0 (p. 14)
- Upgrading from OpenVZ (p. 28)

Second Scenario

You want to upgrade the Host operating system (Host OS) installed on your server together with the Parallels Virtuozzo Containers software running on it. In this case, follow these steps:

- 1 Back up all important Virtuozzo and Container configuration files.
- 2 Reinstall the Host operating system on the server.
- 3 Restore the backed up Virtuozzo and Container configuration files.
- 4 Install Parallels Virtuozzo Containers 4.6 on the server.

Detailed information on this scenario is given in [Upgrading Host Operating Systems with Parallels Virtuozzo Containers](#) (p. 17).

Third Scenario

You have a spare server to perform a new Parallels Virtuozzo Containers 4.6 installation. In this case, follow these steps:

- 1 Install Parallels Virtuozzo Containers 4.6 on the spare server. If the license that you own is in the old license format, refer to the [Upgrading License Manually](#) section (p. 9) below for a way to upgrade the license to the Parallels Virtuozzo Containers 4.6 format; then use it during a fresh installation.
- 2 Migrate all Containers from the Hardware Node you want to upgrade to the spare server.
- 3 If you store the Container (called Virtual Environment in SWsoft Virtuozzo 3.5.1 Service Pack 1) backups on the same Hardware Node, copy the backup folder to the spare server.
- 4 Check that all the Containers on the spare server can be started and stopped. To do this, use Parallels Virtual Automation, Parallels Management Console, and Parallels Virtuozzo Containers command-line utilities.
- 5 Reinstall the operating system on the Hardware Node.

- 6** Install Parallels Virtuozzo Containers 4.6 on the Hardware Node.
- 7** Migrate the Containers back from the spare server to the Hardware Node, if necessary.

Consult the *Parallels Virtuozzo Containers 4.6 User's Guide* and *Parallels Virtuozzo Containers 4.6 Installation Guide* for detailed information on how to migrate Containers between Hardware Nodes and to perform a clean installation of Parallels Virtuozzo Containers 4.6, respectively.

Upgrade Specifics

When upgrading the Hardware Nodes included in a Virtuozzo Group (called the Virtuozzo cluster in SWsoft Virtuozzo 3.5.1 Service Pack 1), do the following:

- 1** Upgrade all Slave Nodes in the Group.
- 2** Upgrade the Master Node.

Upgrading from SWsoft Virtuozzo 3.0 Service Pack 1

Parallels Virtuozzo Containers 4.6 officially supports upgrading Hardware Nodes that run SWsoft Virtuozzo 3.0 Service Pack 1 and one of the following Linux distributions (both x86 and x64 versions):

- Red Hat Enterprise Linux 4
- CentOS 4

It is recommended that you install the latest Parallels Virtuozzo Containers update on the Hardware Node before starting the upgrade procedure. Use the `vzup2date` utility to check that you have all of the available updates installed on the Node.

Preparing for the Upgrade

Follow the below steps to prepare for the upgrade procedure:

- 1 Carefully read the information given in the **Known Issues and Restrictions** section (p. 12). This will help you avoid possible problems related to the upgrade and successfully solve any problems that may appear.
- 2 Check if the license installed on the Hardware Node can be upgraded to support Parallels Virtuozzo Containers 4.6. Parallels Virtuozzo Containers 4.6 does not support the old licensing format; so you need to upgrade the license to use it with Parallels Virtuozzo Containers 4.6. To check if your license is upgradeable, follow the https://register.parallels.com/vz_key_maintenance link, enter the license key number and the email you used when purchasing the license in the respective fields, and click the **Check Maintenance** button. The system will inform you if the license can be automatically upgraded.

Note: If your license cannot be upgraded automatically, see the **Upgrading Licenses Manually** section below to learn how to upgrade licenses manually.

- 3 Obtain the Parallels Virtuozzo Containers 4.6 distribution set. Download the `vzinstall-linux-i386.bin` or `vzinstall-linux-x86_64` utility (for the x86 or x86-64 version of Parallels Virtuozzo Containers 4.6, respectively) from the Parallels web site. You can then use these utilities to download Parallels Virtuozzo Containers 4.6 to your server and install it there.
- 4 As with any major changes to the hard disk, it is recommended that you do the following before starting the upgrade:
 - Back up all Virtual Environments on the Hardware Node.
 - Perform a full backup of the entire Virtuozzo server using a third-party software. For example, you can make use of the Acronis® True Image Echo™ Enterprise Server (a free trial version is available at <http://www.acronis.com/enterprise/download/ATIESWin/>) software allowing you to quickly create an exact copy of your server and to easily restore the entire system if something goes wrong during the upgrade.

Upgrading Licenses Manually

Generally, your license is automatically upgraded to support Parallels Virtuozzo Containers 4.6 during the installation if you have a valid SUS (Software Update Service) or Maintenance contract with Parallels (formerly SWsoft). If you do not have such a contract, contact your sales representative for further information.

If you have a valid SUS or Maintenance contract, but the checking procedure has detected that your license is not upgradeable, use one of the following methods to obtain an upgraded license:

- Follow the https://register.parallels.com/vz_key_upgrade/ link, enter the license key number and the email you used when purchasing the license in the respective fields, and click the **Upgrade** button. You will then receive an email containing the new product key for Parallels Virtuozzo Containers 4.6.
- Contact your sales representative, and request a license upgrade.
- If you have access to the KA (Parallels Key Administrator) server, log in to this server, and upgrade your license manually.

You will have to manually enter the upgraded license key when performing the upgrade.

Notes:

1. Even if your license is not upgradeable, you can still upgrade to Parallels Virtuozzo Containers 4.6. However, you will need to install a valid license on the Hardware Node before you can start using the Parallels Virtuozzo Containers software.
 2. Detailed information on Parallels Virtuozzo Containers licenses is provided in the *Parallels Virtuozzo Containers 4.6 User's Guide*.
-

Upgrading Virtuozzo Software

To upgrade your system to Parallels Virtuozzo Containers 4.6, do the following:

- 1 Download the `vzinstall-linux-i386.bin` or `vzinstall-linux-x86_64.bin` utility (for the x86 or x86-64 version of Parallels Virtuozzo Containers 4.6, respectively) from the Parallels web site.

The process of downloading and installing Parallels Virtuozzo Containers 4.6 with the `vzinstall-linux-i386.bin` and `vzinstall-linux-x86_64.bin` utilities is the same. Therefore, we use a generic term `vzinstall-linux.bin` to indicate both utilities throughout this document.

- 2 Run the `chmod a+x vzinstall-linux.bin` command to make the `vzinstall-linux.bin` utility executable.
- 3 Execute the `vzinstall-linux.bin` utility. You can run `vzinstall-linux.bin` in one of the following modes:
 - In the 'Download and install' mode, the utility automatically starts the upgrade after it has downloaded the Parallels Virtuozzo Containers 4.6 installation files to the server.
 - In the 'Download only' mode, the utility only downloads the Parallels Virtuozzo Containers 4.6 installation files but does not install them on the server. You can copy the downloaded files to the server you plan to upgrade to Parallels Virtuozzo Containers 4.6 and execute the following command:

```
# ./virtuozzo-4.6.0-<build_version>-<arch>.sfx
```

Detailed information on the `vzinstall-linux.bin` utility is provided in the *Parallels Virtuozzo Containers 4.6 Installation Guide*.

During the upgrade, you will have to complete the same steps as those described in the *Parallels Virtuozzo Containers 4.6 Installation Guide* for installing Parallels Virtuozzo Containers 4.6 on a fresh Linux distribution, except for the step where you are asked to upgrade your current license. When deciding on whether to upgrade the license, keep in mind the following:

- You must have an active Internet connection for the license upgrade to complete.
- You can decline the license upgrade and enter the upgraded license later. Consult the previous section for the information on how to manually upgrade licenses.
- If you decline to upgrade the license or your license is non-upgradeable, you will be prompted to enter a valid Parallels Virtuozzo Containers 4.6 license during the upgrade procedure.
- Once your license is upgraded, you will not be able to auto-return to the old licensing format. If, however, you decide to downgrade to one of the previous versions of Parallels Virtuozzo Containers, contact the Parallels support team.

Verifying the Upgrade

Follow these steps to verify that your system has been successfully upgraded to Parallels Virtuozzo Containers 4.6:

- Check that you can log in to the Hardware Node using Parallels tools: Parallels Virtual Automation (former Parallels Infrastructure Manager and Virtuozzo Control Center) and Parallels Management Console (former Virtuozzo Management Console).
- Check that all Containers (formerly Virtual Environments) on the Hardware Node can be started and stopped (using Parallels Virtual Automation, Parallels Management Console, and command-line utilities).
- Check that you can log in to Containers using Parallels Power Panel (former Virtuozzo Power Panels).

Known Issues and Restrictions

When upgrading to Parallels Virtuozzo Containers 4.6, take into account the following:

- Parallels Virtuozzo Containers 4.6 uses a new license format. Make sure that your current license is upgradeable or that you have a new license before starting the upgrade procedure.
- New `vzabackup/vzarestore` utilities are used in Parallels Virtuozzo Containers 4.6 for managing Container backups. If you are backing up Containers to be restored on Hardware Nodes running Virtuozzo 3.0 Service Pack 1 or restoring Container backups made with the help of Virtuozzo 3.0 Service Pack 1, use the `vzbackup/vzrestore` utilities instead.
- It is not possible to renew a backup created with Virtuozzo 3.0 Service Pack 1 in Parallels Virtual Automation or Parallels Power Panel. As a workaround, delete the old backup and then create a new one in two separate steps.
- New `vznetcfg` command options are used in Parallels Virtuozzo Containers 4.6 for managing the Parallels Virtuozzo Containers network. However, the majority of old `vznetcfg` command options are also supported to provide the backward compatibility with Virtuozzo 3.0 Service Pack 1.
- The `vzsnapshot` utility is no longer supported in Parallels Virtuozzo Containers 4.6.
- The support for managing ftp servers, Web servers, and mail servers inside Containers by means of Parallels Management Console has been dropped in Parallels Virtuozzo Containers 4.6.
- The name-based hosting support—that is, the support for running Containers sharing a single external IP address on a single Hardware Node—has been dropped in Parallels Virtuozzo Containers 4.6.
- The support for manually managing VE ID pools in a Virtuozzo cluster has been dropped. In Parallels Virtuozzo Containers 4.6, Container IDs are automatically allocated within a group of Nodes.
- Requesting a new license via Parallels Management Console, Parallels Virtual Automation, or the `vzlicreq` utility is no longer supported in Parallels Virtuozzo Containers 4.6. Instead, follow the instructions given in the **Upgrading Licenses Manually** section (p. 9).
- New configuration sample files are shipped with Parallels Virtuozzo Containers 4.6 and used for creating Containers. If you have upgraded to Parallels Virtuozzo Containers 4.6 and want to continue using old configuration samples, copy them from the `/etc/vz/conf/old_configs` directory to the `/etc/sysconfig/vz-scripts` directory on the Hardware Node.
- Permissions involving the roles created on 3.0 Hardware Nodes using Virtuozzo Control Center are not kept after upgrading to Parallels Virtuozzo Containers 4.6. To continue using these roles on the upgraded Hardware Nodes, edit them one by one and reset the needed permissions.
- The passwords of Virtuozzo Control Center users (except for the password of the `root` user) are not kept after upgrading to Parallels Virtuozzo Containers 4.6. To continue using old user names to log in to Parallels Virtual Automation, use the **Forgot your password?** link on the login page.

- The "Virtuozzo Control Center Users Self-Registration" functionality present in previous versions of the Virtuozzo software and used by new users to self-register in Virtuozzo Control Center and request Containers is no longer supported in Parallels Virtuozzo Containers 4.6. Instead, you can register external user databases in Parallels Virtual Automation and allow any users from the registered databases to request Containers by assigning the **Workflow User** role to these users.
- The submitted VE requests are not kept in Parallels Virtual Automation after upgrading to Parallels Virtuozzo Containers 4.6. Processed the necessary requests before the upgrade.
- The disabled Virtuozzo Control Center users are not kept after upgrading to Parallels Virtuozzo Containers 4.6. To preserve a VZCC user, make sure that her or his login is enabled before starting the upgrade procedure.
- The settings related to the **Container requesting** functionality are not kept after upgrading to Parallels Virtuozzo Containers 4.6. To re-enable this functionality, follow the **Workflow** link under the **Management** group on the Parallels Virtual Automation left menu and configure the necessary settings on the **Setup** tab of the **Workflow** window.
- After upgrading Hardware Nodes running the Virtuozzo 3.0 software and participating in a Virtuozzo cluster to Parallels Virtuozzo Containers 4.6, their membership in the cluster is not kept. To continue centrally managing your Nodes using Parallels Virtual Automation, create a new group and include all the upgraded Hardware Nodes in this group.
- Logging in to a Hardware Node via Parallels Virtual Automation and Parallels Management Console with the **vzagent** credentials is not supported after upgrading the Node to Parallels Virtuozzo Containers 4.6. Use the **root** credentials instead.
- After upgrading to Parallels Virtuozzo Containers 4.6, execute the following command on the Hardware Node (or on the Master Node if you have united your Nodes into a group) to update all Container backup caches:

```
# /opt/vzagent/bin/vzbackupsync
```

This is needed for the **vzbackup** and **vzabackup** utilities and the Parallels tools to correctly display the existing Container backups on the Hardware Node. Run the same command on a Hardware Node if the backups of Containers residing on this Node were stored on a remote storage before the upgrade.

- Hardware Nodes running Virtuozzo 3.0 Service Pack 1 and upgraded to Parallels Virtuozzo Containers 4.6 continue using VZFS v1. That means that all legacy Containers on the upgraded Nodes continue operating on VZFS v1 and all new Containers are also created on the basis of this VZFS version. If you want to use VZFS v2 (which is the default VZFS version on Hardware Nodes with fresh installations of Parallels Virtuozzo Containers 4.6) on the upgraded Nodes, do the following:
 - a** Ascertain that the value of the **VEFORMAT** parameter in the global configuration file (**/etc/vz/vz.conf**) is set to **vz4**.
 - b** Recreate the caches of all EZ OS templates installed on the Node by running the following commands:

```
# vzpkg remove cache EZ_OS_Template_Name
```

```
# vzpkg create cache EZ_OS_Template_Name
```

- All legacy Containers on the upgraded Hardware Nodes will continue using the old Container directory layout. To convert these Containers to use the new Container layout, execute the following command:

```
# vzctl convert CT_ID
```

You need to upgrade a Container to use the new directory layout if you plan to store the Container private area on a shared storage (as it is the case in failover and data sharing clusters). In all other cases, the upgrade to the new layout is not required.

Upgrading from Parallels Virtuozzo Containers 4.0

Parallels Virtuozzo Containers 4.6 officially supports upgrading Hardware Nodes that run Parallels Virtuozzo Containers 4.0 and one of the following Linux distributions (both x86 and x64 versions):

- Red Hat Enterprise Linux 4
- Red Hat Enterprise Linux 5
- CentOS 4
- CentOS 5
- SUSE Linux Enterprise Server 10 with Service Pack 1

It is recommended that you install the latest Parallels Virtuozzo Containers update on the Hardware Node before starting the upgrade procedure. Use the `vzup2date` utility to check that you have all of the available updates installed on the Node.

Preparing for the Upgrade

As with any major changes to the hard disk, it is recommended that you do the following before starting the upgrade:

- Back up all Containers on the Hardware Node.
- Perform a full backup of the entire Hardware Node using a third-party software. For example, you can make use of the Acronis® True Image Echo™ Enterprise Server (a free trial version is available at <http://www.acronis.com/enterprise/download/ATIESWin/>) software allowing you to quickly create an exact copy of your Node and to easily restore the entire system if something goes wrong during the upgrade.

Upgrading to Parallels Virtuozzo Containers 4.6

To upgrade your system to Parallels Virtuozzo Containers 4.6, do the following:

- 1 Download the `vzinstall-linux-i386.bin` or `vzinstall-linux-x86_64.bin` utility (for the x86 or x86-64 version of Parallels Virtuozzo Containers 4.6, respectively) from the Parallels web site.

The process of downloading and installing Parallels Virtuozzo Containers 4.6 with the `vzinstall-linux-i386.bin` and `vzinstall-linux-x86_64.bin` utilities is the same. Therefore, we use a generic term `vzinstall-linux.bin` to indicate both utilities throughout this document.

- 2 Run the `chmod a+x vzinstall-linux.bin` command to make the `vzinstall-linux.bin` utility executable.
- 3 Execute the `vzinstall-linux.bin` utility. You can run `vzinstall-linux.bin` in one of the following modes:
 - In the 'Download and install' mode, the utility automatically starts the upgrade after it has downloaded the Parallels Virtuozzo Containers 4.6 installation files to the server.
 - In the 'Download only' mode, the utility only downloads the Parallels Virtuozzo Containers 4.6 installation files but does not install them on the server. You can copy the downloaded files to the server you plan to upgrade to Parallels Virtuozzo Containers 4.6 and execute the following command:

```
# ./virtuozzo-4.6.0-<build_version>-<arch>.sfx
```

Detailed information on the `vzinstall-linux.bin` utility is provided in the *Parallels Virtuozzo Containers 4.6 Installation Guide*.

During the upgrade, you will have to complete the same steps as those described in the *Parallels Virtuozzo Containers 4.6 Installation Guide* for installing Parallels Virtuozzo Containers 4.6 on a fresh Linux distribution. Consult this guide if you need more information about specific steps.

Verifying the Upgrade

Follow these steps to verify that your system has been successfully upgraded to Parallels Virtuozzo Containers 4.6:

- Check that you can log in to the Hardware Node using Parallels tools: Parallels Virtual Automation (former Parallels Infrastructure Manager and Virtuozzo Control Center) and Parallels Management Console (former Virtuozzo Management Console).
- Check that all Containers (formerly Virtual Environments) on the Hardware Node can be started and stopped (using Parallels Virtual Automation, Parallels Management Console, and command-line utilities).
- Check that you can log in to Containers using Parallels Power Panel (former Virtuozzo Power Panels).

Upgrading Host Operating Systems with Parallels Virtuozzo Containers

Along with upgrading the Parallels Virtuozzo Containers software, you may also wish to upgrade the Host operating system (Host OS) installed on your server. The following table lists the types of Host OS+Parallels Virtuozzo Containers (both Virtuozzo 3.0 Service Pack 1 and Parallels Virtuozzo Containers 4.0) upgrades officially supported in Parallels Virtuozzo Containers 4.6:

<u>Host OS before upgrade</u>	<u>Host OS after upgrade</u>
CentOS 4	CentOS 5
Red Hat Enterprise Server 4	CentOS 5
Red Hat Enterprise Server 4	Red Hat Enterprise Server 5

The procedure of upgrading Host OSs slightly differs depending on the Virtuozzo version installed on the server and is described below.

Upgrading a Host OS with Virtuozzo 3.0

To upgrade a server that runs one of the supported Host OSs and Virtuozzo 3.0 Service Pack 1, do the following:

- 1 Back up all Virtuozzo and Container configuration files. These are the following files:

- `/etc/sysconfig/vz-scripts/*.conf`
- `/etc/sysconfig/vz-scripts/*.mount`
- `/etc/sysconfig/vz-scripts/*.umount`
- `/etc/vz/*`
- `/etc/sysconfig/vz`
- `/etc/cron.d/venetclean`
- `/etc/cron.d/verebboot`

You can back up these files to any location. For example, you can just copy them to the `/vz/conf` partition that is left intact during the upgrade.

- 2 As with any major changes to the hard disk, it is highly recommended that you do the following before starting the upgrade:
 - a Back up all Containers (former Virtual Environments) on the Hardware Node.
 - b Perform a full backup of the entire Virtuozzo server using a third-party software. For example, you can make use of the Acronis® True Image Echo™ Enterprise Server (a free trial version is available at <http://www.acronis.com/enterprise/download/ATIESWin/>) software allowing you to quickly create an exact copy of your server and to easily restore the entire system if something goes wrong during the upgrade.
- 3 Reinstall the Host operating system on the server. When reinstalling the system, make sure that the `/vz` partition is left intact. Once the installation is complete, restart the server.
- 4 Once the Parallels Virtuozzo Containers 4.6 installation is complete, restore the Virtuozzo and Container configuration files you backed up in **Step 1**:
 - Restore the `vz` Virtuozzo global configuration file to the `/etc/sysconfig` directory.
 - Restore the files `/etc/sysconfig/vz-scripts/*.conf`, `/etc/sysconfig/vz-scripts/*.mount`, and `/etc/sysconfig/vz-scripts/*.umount` to the `/etc/sysconfig/vz-scripts` directory.
 - Restore the contents of the `/etc/vz/*` directory to the `/etc/vz` directory.
 - Restore the files `/etc/cron.d/venetclean` and `/etc/cron.d/verebboot` to the `/etc/cron.d` directory.
- 5 Install Parallels Virtuozzo Containers 4.6. For detailed information on installing Parallels Virtuozzo Containers 4.6, see the *Parallels Virtuozzo Containers 4.6 Installation Guide*. Once the installation is complete, restart the server.

Note: During the Parallels Virtuozzo Containers 4.6 installation, new configuration files corresponding to those you restored in **Step 4** are put to the same directory under the name *configuration_file_name.rpmnew*. For example, for the vz global Virtuozzo file, a new configuration file with the name *vz.rpmnew* will be created in the */etc/sysconfig* directory.

- 6** Drop the quota currently set for Containers, and recalculate it:

```
# for i in $(ls /vz/root) ; do vzquota drop "${i}" ; done
# service vz restart
```

Upgrading a Host OS with Parallels Virtuozzo Containers 4.0

To upgrade a server that runs one of the supported Host OSs and Virtuozzo 3.0 Service Pack 1, do the following:

- 1 Back up all Virtuozzo and Container configuration files. These are the following files:

- `/etc/sysconfig/vz-scripts/*.conf`
- `/etc/sysconfig/vz`
- `/etc/vz/*`
- `/etc/cron.d/venetclean`
- `/etc/cron.d/verebboot`

You can back up these files to any location. For example, you can just copy them to the `/vz/conf` partition that is left intact during the upgrade.

- 2 As with any major changes to the hard disk, it is recommended that you do the following before starting the upgrade:

- a Back up all Containers (former Virtual Environments) on the Hardware Node.
- b Perform a full backup of the entire Virtuozzo server using a third-party software. For example, you can make use of the Acronis® True Image Echo™ Enterprise Server (a free trial version is available at <http://www.acronis.com/enterprise/download/ATIESWin/>) software allowing you to quickly create an exact copy of your server and to easily restore the entire system if something goes wrong during the upgrade.

- 3 Reinstall the Host operating system on the server. When reinstalling the system, make sure that the `/vz` partition is left intact. Once the installation is complete, restart the server.

- 4 Once the Parallels Virtuozzo Containers 4.6 installation is complete, restore the Virtuozzo and Container configuration files you backed up in Step 1:

- Restore the `vz` Virtuozzo global configuration file to the `/etc/sysconfig` directory.
- Restore the `/etc/sysconfig/vz-scripts/*.conf` file to the `/etc/sysconfig/vz-scripts` directory.
- Restore the contents of the `/etc/vz/*` directory to the `/etc/vz` directory.
- Restore the files `/etc/cron.d/venetclean` and `/etc/cron.d/verebboot` to the `/etc/cron.d` directory.

- 5 Install Parallels Virtuozzo Containers 4.6. For detailed information on installing Parallels Virtuozzo Containers 4.6, see the *Parallels Virtuozzo Containers 4.6 Installation Guide*. Once the installation is complete, restart the server.

Note: During the Parallels Virtuozzo Containers 4.6 installation, new configuration files corresponding to those you restored in Step 3 are put to the same directory under the name `configuration_file_name.rpmnew`. For example, for the `vz` global Virtuozzo file, a new configuration file with the name `vz.rpmnew` will be created in the `/etc/sysconfig` directory.

6 Restart the Virtuozzo service:

```
# service vz restart
```

Upgrading Nodes in Clusters

This chapter describes how to upgrade nodes running Parallels Virtuozzo Containers 4.0 or SWsoft Virtuozzo 3.0 with Service Pack 1 and participating in two types of clusters:

- failover clusters
- data sharing clusters

Upgrading Nodes in a Failover Cluster

The process of upgrading nodes in a failover cluster includes the following steps:

- 1 Upgrading active nodes in the cluster.
- 2 Upgrading passive nodes in the cluster.

Important! Upgrade one cluster node at a time. Upgrading more than one node simultaneously is not supported and may damage your systems.

Checking Clustered Services

Each active node must be upgraded together with the clustered service running on it. So before starting the upgrade procedure, make sure that you know which clustered service is running on which node. To see the list of clustered services and the nodes where they are running, run this command on any of your cluster nodes:

```
# clustat
Service Name      Owner (Last)      State
-----
service:vz-0      server1.com        started
service:vz-1      server2.com        started
```

Once you upgrade all active nodes in the cluster, no clustered services must be left un-upgraded.

Upgrading Active Nodes in the Cluster

First, you need to upgrade all active nodes in the failover cluster. To upgrade an active node, do the following:

- 1 Freeze the clustered service running on the active node:

```
# clusvcadm -Z clustered_service_name
```

(where *clustered_service_name* is the name of the clustered service)

If your version of `clusvcadm` does not support the `-Z` option, use the `-l` option instead. This option prevents the specified clustered service from running on a local node (that is, on the node where you run the command). If you use the `-l` option, execute the command on all cluster nodes (both active and passive), except for the node you are upgrading.

- 2 Open the `/etc/fstab` file on the node for editing, and add the `/vz` entry to it. Make sure you add the right `/vz` entry to the file:

- a Run the `clustat` utility to find out the name of the clustered service running on the active node.
- b Search the cluster configuration file (`/etc/cluster/cluster.conf`) for the UUID of the device associated with the clustered service, for example:

```
# cat /etc/cluster/cluster.conf
...
<service autostart="1" exclusive="1" name="vz-1" recovery="relocate">
    <fs device="UUID=39028daf-0337-4403-9567-84507ac7cb50"
force_fsck="0" force_unmount="0" fstype="ext3" mountpoint="/vz" name="fs-vz-1"
options="" self_fence="0">
...
```

In this example, the `vz-1` clustered service is associated with the device UUID `UUID=39028daf-0337-4403-9567-84507ac7cb50`.

- c Add the `/vz` entry to `/etc/fstab`. For the example above, this string will look like the following:

```
UUID="39028daf-0337-4403-9567-84507ac7cb50" /vz ext3 defaults,noatime 0 0
```

- 3 Disable the startup of the `rgmanager` and `cman` clustering services, and enable the startup of the `vz` service:

```
# chkconfig rgmanager off
# chkconfig cman off
# chkconfig vz on
```

- 4 Install Parallels Virtuozzo Containers 4.6 on the node. For detailed information on installing Parallels Virtuozzo Containers 4.6, see the *Parallels Virtuozzo Containers 4.6 Installation Guide*; for upgrade details, see the *Upgrading from SWsoft Virtuozzo 3.0 Service Pack 1* (p. 7) and *Upgrading from Parallels Virtuozzo Containers 4.0* (p. 14) chapters.

- 5 Once the installation is complete, restart the node, and wait for the Parallels Virtual Automation application to get upgraded.

- 6 Enable the startup of the `cman` and `rgmanager` services, and disable the startup of the `vz`, `pvapp`, and `pvaagentd` services:

```
# chkconfig cman on
# chkconfig rgmanager on
# chkconfig vz off
# chkconfig pvapp off
# chkconfig pvaagentd off
```

- 7 Open the `/etc/fstab` file for editing, and remove the `/vz` entry from it.

Upgrading Passive Nodes in the Cluster

Now that you have upgraded all active nodes in the cluster, you can proceed with upgrading passive nodes. To upgrade a passive node, do the following:

- 1 Make sure that the node does not have a `/vz` partition mounted.
- 2 Install Parallels Virtuozzo Containers 4.6 on the node (see instructions below). When installing Parallels Virtuozzo Containers 4.6 on a passive node, pay attention to the following:
 - a Use the `--clustermode` option when installing Parallels Virtuozzo Containers on passive nodes:
 - If you use the `vzinstall-linux.bin` utility, run this command:

```
# ./vzinstall-linux-x86_64.bin install --vzinstall-opts "--clustermode"
```

- If you use the `install` utility, run this command:

```
# ./install --clustermode
```

- a** If you used the Parallels Infrastructure Manager application for administering your cluster nodes, you also need to upgrade this application. First of all, update Parallels Infrastructure Manager to its latest version. When installing Parallels Virtuozzo Containers 4.6, specify the `--pva-agent` option, for example:

```
# ./vzinstall-linux-x86_64.bin install --vzinstall-opts "--clustermode --pva-agent"
```

or

```
# ./install --clustermode --pva-agent
```

- 3** Disable the startup of the `pvapp` and `pvaagentd` services:

```
# chkconfig pvapp off
# chkconfig pvaagentd off
```

For detailed information on installing Parallels Virtuozzo Containers 4.6, see the *Parallels Virtuozzo Containers 4.6 Installation Guide*. For upgrade details, see the *Upgrading from SWsoft Virtuozzo 3.0 Service Pack 1* (p. 7) and *Upgrading from Parallels Virtuozzo Containers 4.0* (p. 14) chapters.

Finishing the Upgrade

Once you upgrade all active and passive nodes, configure the cluster configuration file (`/etc/cluster/cluster.conf`) as follows:

- 1** Add to the `<resources>` section these lines:

```
<script file="/etc/init.d/pvaagentd" name="pvascr"/>
<script file="/etc/init.d/pvapp" name="ppscr"/>
```

- 2** Add to the `<service>` section of each clustered service these lines:

```
<script ref="pvascr"/>
<script ref="ppscr"/>
```

- 3** Increase the value of the `config_version` parameter by 1.
- 4** Save the file, and run the `ccs_tool` utility to update the cluster configuration.
- 5** Restart all cluster nodes one by one.

Finally, you need to unfreeze the clustered services on all active nodes:

```
# clusvcadm -U clustered_service_name
```

If you used the `-l` option to lock the clustered service, specify the `-u` option after `clusvcadm` to unlock the service. Unlock all services on all nodes where you locked them.

Upgrading Nodes in a Data Sharing Cluster

Like it is the case with a failover cluster, the process of upgrading nodes in a data sharing cluster also includes two steps:

- 1 Upgrading active nodes in the cluster.
- 2 Upgrading passive nodes in the cluster.

However, each of these steps contains additional operations that you need to perform to upgrade cluster nodes.

Important! Upgrade one cluster node at a time. Upgrading more than one node simultaneously is not supported and may damage your systems.

Checking Clustered Services

Each active node must be upgraded together with the clustered service running on it. So before starting the upgrade procedure, make sure that you know which clustered service is running on which node. To see the list of clustered services and the nodes where they are running, run this command on any cluster node:

```
# clustat
Service Name      Owner (Last)      State
-----
service:vz-0      server1.com        started
service:vz-1      server2.com        started
```

Once you upgrade all active nodes in the cluster, no clustered services must be left un-upgraded.

Upgrading Active Nodes in the Cluster

First, you need to upgrade all active nodes in the data sharing cluster. To upgrade an active node:

- 1 Freeze the clustered service running on all active nodes in the cluster. To do this, run the following command on each active node:

```
# clusvcadm -Z clustered_service_name
```

(where *clustered_service_name* is the name of the clustered service)

If your version of `clusvcadm` does not support the `-Z` option, use the `-l` option instead. This option prevents the specified clustered service from running on a local node (that is, on the node where you run the command). If you use the `-l` option, execute the command on all cluster nodes (both active and passive), except for the node you are upgrading.

- 2 Disable the startup of the `rgmanager` clustering service, and enable the startup of the `vz` service:

```
# chkconfig rgmanager off
# chkconfig vz on
```

If you are upgrading the node running SUSE Linux Enterprise Server, you need to additionally disable the `openais` service:

```
# chkconfig openais off
```

- 3 Install Parallels Virtuozzo Containers 4.6 on the node. For detailed information on installing Parallels Virtuozzo Containers 4.6, see the *Parallels Virtuozzo Containers 4.6 Installation Guide*; for upgrade details, see the *Upgrading from SWsoft Virtuozzo 3.0 Service Pack 1* (p. 7) and *Upgrading from Parallels Virtuozzo Containers 4.0* (p. 14) chapters.
- 4 Once the installation is complete, restart the node, and wait for the Parallels Virtual Automation application to get upgraded. To make sure that the Parallels Virtual Automation upgrade is complete, check that the `pva-setup` process is not present in the list of process running on the node.
- 5 Enable the startup of the `rgmanager` service, and disable the startup of the `vz`, `pvapp`, and `pvaagentd` services:

```
# chkconfig rgmanager on
# chkconfig vz off
# chkconfig pvapp off
# chkconfig pvaagentd off
```

Upgrading Passive Nodes in the Cluster

Now that you have upgraded all active nodes in the cluster, you can proceed with upgrading passive nodes. To upgrade a passive node, do the following:

- 1 Make sure that the node does not have a `/vz` partition mounted. If it does, unmount the partition.
- 2 Comment the `/vz` entry in the `/etc/fstab` file.
- 3 Disable the startup of the `gfs`, `gfs2`, `cman`, and `rgmanager` services, and enable the startup of the `VZ` service:

```
# chkconfig gfs off
# chkconfig gfs2 off
# chkconfig rgmanager off
# chkconfig cman off
# chkconfig vz on
```

If you are upgrading the node running SUSE Linux Enterprise Server, you need to additionally disable the `openais` service:

```
# chkconfig openais off
```

If your data shared storage is located on an NFS volume, you do not need to disable the `gfs` and `gfs2` services.

- 4 Install Parallels Virtuozzo Containers 4.6 on the node:
 - a Use the `--clustermode` option when installing Parallels Virtuozzo Containers 4.6 on passive nodes:

- If you use the `vzautoinstall` utility, run this command:

```
# ./vzinstall-linux-x86_64.bin install --vzinstall-opts "--clustermode"
```

- If you use the `install` utility, run this command:

```
# ./install --clustermode
```

- a If you used the Parallels Infrastructure Manager application (renamed to Parallels Virtual Automation in Parallels Virtuozzo Containers 4.6) for administering your cluster nodes, you also need to upgrade this application. First of all, update Parallels Infrastructure Manager to its latest version. When installing Parallels Virtuozzo Containers 4.6, specify the `--pva-agent` option, for example:

```
# ./vzinstall-linux-x86_64.bin install --vzinstall-opts "--clustermode --pva-agent"
```

or

```
# ./install --clustermode --pva-agent
```

- 5 Once the installation is complete, restart the node. If you chose to upgrade Parallels Virtual Automation, wait for it to get upgraded.
- 6 Make sure that the /vz directory does not contain any files or folders.
- 7 Uncomment the /vz entry to the /etc/fstab file.
- 8 Enable the startup of the gfs, gfs2, cman, and rgmanager services, and disable the startup of the vz, pvapp, and pvaagentd services:

```
# chkconfig gfs on
# chkconfig gfs2 on
# chkconfig cman on
# chkconfig rgmanager on
# chkconfig vz off
# chkconfig pvapp off
# chkconfig pvaagentd off
```

For detailed information on installing Parallels Virtuozzo Containers 4.6, see the *Parallels Virtuozzo Containers 4.6 Installation Guide*. For upgrade details, see the *Upgrading from SWsoft Virtuozzo 3.0 Service Pack 1* (p. 7) and *Upgrading from Parallels Virtuozzo Containers 4.0* (p. 14) chapters.

Finishing the Upgrade

Once you upgrade all active and passive nodes, configure the cluster configuration file (/etc/cluster/cluster.conf) as follows:

- 1 Add to the <resources> section these lines:

```
<script file="/etc/init.d/pvaagentd" name="pvascr"/>
<script file="/etc/init.d/pvapp" name="ppscr"/>
```

- 2 Add to the <service> section of each clustered service these lines:

```
<script ref="pvascr"/>
<script ref="ppscr"/>
```

- 3 Increase the value of the config_version parameter by 1.
- 4 Save the file, and run the ccs_tool utility to update the cluster configuration.
- 5 Restart all cluster nodes one by one.

Finally, you need to unfreeze the clustered services on all active nodes:

```
# clusvcadm -U clustered_service_name
```

If you used the -l option to lock the clustered service, specify the -u option after clusvcadm to unlock the service. Unlock all services on all nodes where you locked them.

Upgrading from OpenVZ

Parallels Virtuozzo Containers 4.6 allows you to upgrade servers running OpenVZ (www.openvz.org) to Parallels Virtuozzo Containers 4.6. To do this:

- 1 Update OpenVZ to its latest version. You can download the latest versions of OpenVZ packages from <http://download.openvz.org>.
- 2 Back up the physical server and all Containers on this server. For example, you can use the Acronis® True Image Echo™ Enterprise Server (a free trial version is available at <http://www.acronis.com/enterprise/download/ATIESWin/>) software to create a backup copy of your system and to restore it if something goes wrong during the upgrade.
- 3 Download the `vzinstall-linux-i386.bin` or `vzinstall-linux-x86_64.bin` utility (for the x86 or x86-64 version of Parallels Virtuozzo Containers 4.6, respectively) from the Parallels web site.

The process of downloading and installing Parallels Virtuozzo Containers 4.6 with the `vzinstall-linux-i386.bin` and `vzinstall-linux-x86_64.bin` utilities is the same. Therefore, we use a generic term `vzinstall-linux.bin` to indicate both utilities throughout this document.

- 4 Make the `vzinstall-linux.bin` file executable:

```
# chmod a+x vzinstall-linux.bin
```

- 5 Execute the `vzinstall-linux.bin` utility. You can run `vzinstall-linux.bin` in one of the following modes:

- In the 'Download and install' mode, the utility automatically starts the upgrade once it downloads the Parallels Virtuozzo Containers 4.6 installation files to the server.
- In the 'Download only' mode, the utility only downloads the Parallels Virtuozzo Containers 4.6 installation files but does not install them on the server. You can copy the downloaded files to the server where you plan to upgrade to Parallels Virtuozzo Containers 4.6 and execute the following command:

```
# ./virtuozzo-4.6.0-<build_version>-<arch>.sfx
```

Detailed information on the `vzinstall-linux.bin` utility is provided in the *Parallels Virtuozzo Containers 4.6 Installation Guide*. Consult this guide if you need more information about specific steps.

Note: The current version of Parallels Virtuozzo Containers supports upgrading servers running CentOS 4 and 5 and Gentoo. However, for CentOS 4 and Gentoo, you first need to upgrade the Host operating systems to CentOS 5.

Performing Post-Upgrade Operations

Use the guidelines below to configure your system once the upgrade is complete.

Installing Templates

During the upgrade, the SimFS filesystem used by OpenVZ Containers is converted to VZFS used by Containers in Parallels Virtuozzo Containers 4.6. As a result, you cannot use old OS templates on upgraded Nodes to create new Containers. To be able to create new Containers, you need first to install OS templates used in Parallels Virtuozzo Containers 4.6 and called EZ templates. To install an OS EZ template, execute the `vzup2date -z` command on the server, and follow the on-screen instructions. For detailed information on the `vzup2date` utility, see the *Downloading and Installing EZ Templates with vzup2date* section in the *Parallels Virtuozzo Containers 4.6 Templates Management Guide*.

Once you install an OS EZ template, you can create a new Container on its basis using the `--ostemplate` option of the `vzctl create` command. For detailed information on creating Containers, see the *Parallels Virtuozzo Containers 4.6 User's Guide*.

Upgrading Existing Containers

Upgraded Containers continue using old OS templates after the upgrade. To make existing Containers fully compatible with Parallels Virtuozzo Containers 4.6, you need to install the new EZ OS templates that correspond to the OS templates used by OpenVZ Containers. For example, if a Container was based on the CentOS 4 OpenVZ template, install the CentOS 4 EZ OS template on the server. Once you install an OS EZ template used by a Container, the Container automatically starts using this template instead of the old one.

To download and install OS EZ templates, execute the `vzup2date -z` command on the server, and follow the on-screen instructions. For detailed information on the `vzup2date` utility, see the *Downloading and Installing EZ Templates with vzup2date* section in the *Parallels Virtuozzo Containers 4.6 Templates Management Guide*.

Once you install an OS EZ template, you are recommended to run the `vzpkg link CT_ID` command. When executed, this command replaces real files in the Container private area with symlinks to these very files on the server. This can free megabytes of disk space on the server. For more information on using the `vzpkg link` command, see the *Cleaning Up Containers* section in the *Parallels Virtuozzo Containers 4.6 User's Guide*.

Configuring Virtual Ethernet Network Adapters

If any of your Containers were operating in the bridged mode (that is, had one or more virtual Ethernet adapters configured) before the upgrade, you need to re-configure these Containers once the upgrade is complete. To do this:

- 1 Roll back all changes you made when configuring bridge interfaces and virtual Ethernet adapters on the server with OpenVZ. If you do not remember exactly what settings you changed, consult the manual at http://wiki.openvz.org/VEs_and_HNs_in_same_subnets.

- 2** Configure the networking on the upgraded server. This includes the following steps:
 - a** Creating one or more Virtual Networks on the server (a counterpart of bridge interfaces in OpenVZ).
 - b** Making virtual network adapters for Containers.
 - c** Adding Containers to the created Virtual Networks.

For detailed information on each of these steps, see the **Managing Parallels Virtuozzo Containers Network** chapter in the *Parallels Virtuozzo Containers 4.6 User's Guide*.

Rolling Back to a Previous Version

This section describes how to roll back an unsuccessful upgrade from Parallels Virtuozzo Containers 4.6 to Parallels Virtuozzo Containers 4.0 or Virtuozzo 3.0 Service Pack 1.

If the upgrade was unsuccessful, use one of the following ways to return the system to its original state:

- If you created a backup of the entire Hardware Node (for example, using the Acronis® True Image Echo™ Enterprise Server software) before the upgrade, perform a full system restore by following the instructions given in the corresponding product documentation.
- If you backed up all Containers (former Virtual Environments) that existed on the Hardware Node before the upgrade, but did not create a full backup of the Hardware Node, do the following:
 - a** Reinstall the Linux distribution on the Node.
 - b** Install the original version of the product on the Node (Virtuozzo 3.0 Service Pack 1 or Parallels Virtuozzo Containers 4.0).
 - c** Restore the Containers from their backups.

Before starting the rollback operation, run the `vzreport` utility to contact the Parallels support team and inform it of the problem you have encountered. This utility automatically collects the necessary logs, network, system, and troubleshooting information into a single file and downloads it to the Parallels technical support server. `vzreport` does not send your private information to Parallels.

If it is impossible to make use of the `vzreport` utility, please back up the log files generated during the upgrade procedure and send them to the Parallels support team. Please provide the support team with the following log files:

- `/var/log/vzsveupgrade.log`
- `/root/vzinstall.log` (if you performed the upgrade using the `install` utility)
- `/root/virtuozzo/vzautoinstall.log` (if you performed the upgrade using the `vzinstall-linux.bin` utility)

Getting Technical Support

If you experience any problems related to upgrading your software to Parallels Virtuozzo Containers 4.6, do the following:

- If you have a Customer Relationship manager or a dedicated support engineer assigned to your company, please feel free to contact them for any questions related to the Parallels Virtuozzo Containers 4.6 upgrade.
- In all other cases, use one of the following ways to get technical support from Parallels (available 24/7 via email and phone):
 - Open a support ticket by filling in a special support form at <https://www.parallels.com/en/support/virtuozzo/request/> or submitting a support request using the `vzreport` utility. You can then use the Parallels Support RT self-service interface available at <https://support.parallels.com> to open and track your ticket.
 - If your support plan includes phone assistance, call 866.248.8906 (toll-free for US and Canada customers) or +1.703.286.2196 (internationally).

Problem Escalation

We make every effort to ensure that your problems are processed quickly and effectively. If, however, there are delays in processing your ticket past the time period that is stated in your support contract, you can escalate the problem by opening the <http://kb.parallels.com/en/5850> page and using the instructions provided on this page.